COUNCIL REPORT

CITY OF MOUNTAIN VIEW

AGENDA: March 22, 2011

5.1

CATEGORY: Public Hearing

DEPT.: Community Development

TITLE: Mountain View Green Building Code

RECOMMENDATION

1. Make the required findings for amendments to the California Green Building Code.

2. Introduce AN ORDINANCE AMENDING CHAPTER 8, ARTICLE I, DIVISION III, OF THE MOUNTAIN VIEW CITY CODE, RELATING TO THE ADOPTION OF THE 2010 CALIFORNIA GREEN BUILDING STANDARDS CODE TO INCLUDE LOCAL GREEN BUILDING REQUIREMENTS (Attachment 5 to the staff report) to be read in title only, further reading waived.

FISCAL IMPACT

The fiscal impact to the City from this ordinance will be minimal. Funding for staff training has already been budgeted for this year and any additional training can be accomplished from the Community Development Department's existing training budget.

INTRODUCTION

The proposed Mountain View Green Building Code (MVGBC) amends the State-mandated California Green Building Code (CalGreen) to include local green building standards and requirements for private development. The proposed MVGBC applies green building requirements per building type and threshold to new construction, residential additions and commercial/industrial tenant improvements and includes energy efficiency standards that exceed the 2008 Building Energy Efficiency Standards.

The process for amending CalGreen includes: (1) approval by the City Council; (2) submitting a cost-effectiveness study to the California Energy Commission (CEC) demonstrating that the proposed energy requirements are cost-effective; and (3) filing the amendments with the California Building Standards Commission (BSC). Approval from the CEC takes approximately three months and must be obtained before the amendments become effective. No approval is necessary from the BSC.

This report summarizes how the MVGBC has been developed, describes its major elements and discusses how the ordinance affects the associated costs and returns on investment for private development.

BACKGROUND

City Council Study Session—September 14, 2010

The purpose of the Study Session was to provide an update on the MVGBC process and receive feedback on the overall proposed approach. At this meeting, staff presented an overview of green building concepts and a framework for the MVGBC. This framework was based on the Santa Clara County Cities Association Green Building Collaborative's Phase II Recommendation (see Attachment 1—Phase II Recommendations), which is a reference guide for applying third-party green building standards to various building types and is intended to provide consistency of private green building standards within the County. Staff also developed the framework from input from the MVGBC's Technical Advisory Group and from internal staff criteria. The Study Session staff report summarizes the proposed MVGBC development process and staff's recommended approach to the requirements, verification process and incentives (see Attachment 2—City Council Study Session Staff Report, September 14, 2010).

At this meeting, Councilmembers asked for additional information on the following topics (see Attachment 3—Study Session Minutes, September 14, 2010); staff responses are included in italics:

- Existing Apartments: How can the MVGBC encourage owners of existing apartment buildings to make green building improvements?

  Staff and the TAG members think that outreach targeting multiple-family property owners with information on rebate programs for water and energy reduction and the use of green building products would be beneficial. However, additional requirements targeting existing apartments would not be effective. Typically, apartment building improvements involve minor upgrades to maintain the building; i.e., water heater and furnace replacements, reroofing, general maintenance and other minor repairs as needed. The Building Division currently enforces the State Building Code's minimum mandatory energy efficiency requirements when apartment units are remodeled or equipment is replaced. Typically, any landscaping modifications are captured by the Water Conservation in Landscaping Ordinance. Additional green building requirements focused on interior improvements such as finishes and low-water-use fixtures would likely deter property owners from the permit process and create enforcement issues. Therefore, staff does not recommend additional green building requirements for apartment buildings.

- Residential Remodels: Are there any improvements that can be required for residential remodels?

  The Building Division enforces State-mandated minimum energy efficiency standards when homes are remodeled or equipment replaced. By complying with current codes, the energy

efficiency of the existing house increases incrementally over time. Staff is concerned that adding green building or energy efficiency requirements for minor projects that are above and beyond the minimum State code might cause owners to avoid the permitting process due to added costs. Local building departments around the State are struggling with the lack of permits being obtained for equipment replacements like water heaters, furnaces and air conditioners. Staff worked with consultants to determine a threshold where energy improvements are reasonable, technically feasible and do not expand the proposed scope of work.

- Costs: Can staff provide additional cost information for green building improvements for private development?

  Cost information has been provided under the Costs to Private Development Section of this report.

- Training: Will staff receive green building-related training?

  Green building-related training for staff will be provided with $5,000 from the Fiscal Year 2009-10 budget earmarked for training. Staff is still developing the scope for this training, but it will likely include both introductory and advanced green building concepts relevant to Planning, Building and Public Works staff. Continual staff training can be accomplished internally and within the Community Development Department's existing training budget.

Development of the MVGBC: Public Outreach and Comments

After the Council Study Session, staff drafted the proposed MVGBC and performed additional outreach.

On November 5, 2010, two outreach meetings were held for contractors specializing in smaller building projects such as residential remodels. The purpose of these meetings was to receive input on how the proposed MVGBC might impact their business and their ability to comply with the requirements. The 11 attendees did not have major comments or issues with the proposed MVGBC.

On December 8, 2010, staff met with MVGBC Technical Advisory Group (TAG) members to discuss the draft ordinance. A main discussion topic was staff's proposed "meet the intent" of a rating system approach to verification. Some members questioned why formal third-party certification was not being required and felt that the formal certification process ensures consistent review and reliability that the standards are achieved. They noted that "meeting the intent" is not a meaningful documentation of performance. Other members commented that the recommended approach of "meeting the intent" of the rating system is a good first step to improved green building standards.

Other outreach efforts included staff discussions on the proposed MVGBC standards with applicants currently in the City's development review process; posting information on the City's web site and in the Community Development Department; and publishing an announcement in *The View* newsletter.

The Silicon Valley Leadership Group (SVLG) reviewed the proposed MVGBC and has submitted a letter of support (see Attachment 4—Letter from SVLG). The SVLG helped form the Santa Clara County Cities Association's Green Building Collaborative, which has provided direction for cities to consider as they develop their own green building ordinances.

ANALYSIS

MVGBC: Green Building Requirements

The proposed MVGBC amends the State's CalGreen Code to administer local green building standards and requirements for new construction, residential additions and commercial/ industrial tenant improvements for private development. The amendments also clarify existing mandatory CalGreen requirements to be consistent with existing City regulations (see Attachment 5—Ordinance—MVGBC Amendments).

The proposed MVGBC references third-party rating systems LEED®[1] (Leadership in Energy and Environmental Design) and GPR (GreenPoint Rated), and requires affected projects to attain a specific amount of points based on an itemized checklist of green building measures from the respective rating system. As discussed at the Study Session, these rating systems were selected because they are commonly used, marketable and many developers already have staff trained in these systems. The project thresholds and point requirements recommended by staff are based on our current development review process, current and foreseeable project types, TAG input and the Phase II recommendations.

Additionally, projects regulated by the proposed MVGBC will be required to exceed the 2008 Building Energy Efficiency Standards and comply with the mandatory requirements of the State's 2010 CalGreen Code. These requirements correspond with points in the LEED® and GPR systems and work towards meeting the respective minimum point totals. The proposed energy requirements are based on construction feasibility and cost-effectiveness as identified by our consultants and on third-party incentive or rebate programs that require specific energy efficiency above the 2008 Standard.

The proposed MVGBC also includes a list of prescriptive requirements for residential additions and nonresidential tenant improvements that focus on energy reduction, water reduction and the use of low VOC products. Staff has proposed to focus on these requirements for additions and tenant improvements because they do not expand the

[1] LEED is a trademark owned by the U.S. Green Building Council.

proposed scope of work, are cost-effective or cost-neutral, reduce the use of resources, or improve indoor air quality.

The proposed MVGBC applies energy and green building requirements per building type and threshold, as shown in the table below:

PROPOSED MANDATORY GREEN BUILDING REQUIREMENTS

Project Type	Energy Requirement[1]	Green Building Standard and Requirement
RESIDENTIAL PROJECTS (SINGLE-FAMILY, MULTI-FAMILY)		
New Construction		
New Residential < 5 units	15% above Title 24, Part 6	Mandatory CalGreen Requirements
New Residential ≥ 5 units	15% above Title 24, Part 6[2]	Meet the intent of 70 GreenPoint Rated points and Mandatory CalGreen Requirements
Additions[3] (applies to conditioned space only)		
Additions ≥1,000 square feet	10% above Title 24, Part 6	Mandatory CalGreen Requirements: Sec. 4.303 (Indoor Water Use) Sec. 4.504 (Pollutant Control)
MIXED-USE PROJECTS		
New Construction		
New Residential < 5 units and New Nonresidential Use < 25,000 square feet	15% above Title 24, Part 6 for Residential; 10% above Title 24, Part 6 for Nonresidential	Residential and Nonresidential criteria as applicable to each component of the project.
New Residential ≥ 5 units and New Nonresidential Use ≥25,000 square feet	15% above Title 24, Part 6 for Residential; 10% above Title 24, Part 6 for Nonresidential	
NONRESIDENTIAL PROJECTS (INCLUDE HOTEL[2])		
New Construction[4]		
New Nonresidential Buildings < 5,000 square feet	10% above Title 24, Part 6	Mandatory CalGreen Requirements
New Nonresidential Buildings 5,000 to 25,000 square feet	10% above Title 24, Part 6	Meet the intent of LEED® Certified and Mandatory CalGreen Requirements
New Nonresidential Buildings > 25,000 square feet	10% above Title 24, Part 6	Meet the intent of LEED® Silver and Mandatory CalGreen Requirements

Tenant Improvements		
Tenant Improvements ≥15,000 square feet with a $100,000 construction valuation where the scope of work includes any of the following: (1) requires a Title 24 energy calculation; (2) the replacement or addition of any plumbing fixtures and/or interior finish materials (i.e., carpeting, paint, etc.).	10% above Title 24, Part 6 for Lighting Only	Mandatory CalGreen Requirements: Section 5.303 (Indoor Water Use) Section 5.504 (Pollutant Control)

1. On-site generation of renewable energy in an amount equivalent to the required reductions may be used as an alternate means to meet the local energy requirement. Energy production shall be determined through use of the CECPV Calculator provided by the California Energy Commission.

2. For high-rise residential buildings (over three stories in height) and hotels, plug and lighting energies can be deducted from both the standard and proposed building when conducting the Title 24, Part 6 energy calculations.

3. Residential additions that include interior alterations may use the total area (in square feet) of improvements in the Title 24 energy calculations and may account for energy efficiency upgrades that already exist in the structure, assuming the upgrades comply with the 2008 Building Energy Efficiency Standards.

4. New shell construction with minimally installed systems are required to attain the following energy requirements above Title 24, Part 6: Cold Shell (no HVAC and no lighting)—5% or Warm Shell (includes HVAC and no lighting)—7%.

Verification

The proposed MVGBC does not require formal certification from a third-party organization. Instead, projects will be required to be designed and constructed to "meet the intent" of a third-party rating system. This approach aims to achieve environmental benefits while minimizing the administrative costs, enforcement issues and project review times associated with formal certification. This approach is consistent with most cities' green building ordinance policies and is one of the verification methods specified in the Phase II recommendations.

The MVGBC can be enforced and administered within our current process. For residential additions and nonresidential tenant improvements, the applicant can demonstrate compliance by incorporating the requirements into the building permit submittal documentation. For new construction projects, this process will require a green building professional with an industry license submitting the green building checklist, project construction documentation and specifications demonstrating compliance, and a letter describing that the project has been designed to meet requirements of the ordinance. Trained staff members will review the documentation for compliance. The City currently utilizes plan check consulting services with personnel already trained in LEED® and GPR.

Incentives

Incentives are not included within the proposed MVGBC. In most instances, incentives such as expedited processing or cost adjustments would not result in meaningful incentives for a developer. However, the General Plan update process has identified draft policy language that incentivizes highly sustainable development. To implement this, a proposed General Plan action item could be used to develop a range of highly sustainable performance measures for the North Bayshore and East Whisman change areas. These measures could be required for new development projects that propose to exceed a certain "base" floor area ratio.

Costs to Private Development: Cost-Effectiveness Study and Incremental Cost Analysis

Staff worked with Global Green USA, a green building consultant, and Gary Farber & Associates, an energy consultant, to conduct a Cost-Effectiveness Analysis to analyze the additional costs associated with improved energy performance for prototypical building types (see Attachment 6—Cost-Effectiveness Analysis). The prototypical building types are based on analysis of existing building types and anticipated future development types within the City. The Cost-Effectiveness Analysis demonstrates that all of the prototypical buildings analyzed in the study have a payback period of less than 15 years and a positive return on investment over a 15-year period, except for small retail and medium-size office buildings, which have a 16.7- and 17.7-year payback period, respectively. In California, the CEC identifies an acceptable payback period as 30 years or less. In February 2011, staff submitted the draft MVGBC to the CEC and received informal feedback that the energy requirements and Cost-Effectiveness Analysis meet their criteria.

Global Green USA also prepared a Green Building Incremental Measure and Cost Analysis to better understand the types of improvements and corresponding costs that would be necessary for projects to meet the proposed MVGBC (see Attachment 7—Green Building Incremental Measure and Cost Analysis). The projects reviewed include 220 View Street, a 22-unit condominium development; and 331 Fairchild Drive, an 87,000 square foot commercial office development. These projects were chosen because they are representative projects designed without the use of green building rating systems, and their building permit plans were available for review. The analysis shows that these projects could have been designed and constructed to meet the proposed MVGBC with a 1 percent construction cost increase. Importantly, some of the improvements that were calculated for the projects to meet the MVGBC are either already City policy, part of the State-mandated CalGreen Code or common trends found in new development in Mountain View.

STATEMENT OF FINDINGS

CalGreen Code Section 101.7.1 provides that for a city to make necessary changes to the CalGreen Code, it must make findings for each amendment, addition or deletion based upon climactic, topographical or geological conditions, including local environmental conditions as

established by the city. Staff recommends that the City find that the amendments to CalGreen are necessary due the following local environmental conditions:

1. Climate Change: The City finds that climate change is a global and local environmental condition. On November 3, 2009, in response to climate change, the City Council approved community-wide Greenhouse Gas Reduction Targets which align with the provisions of California Assembly Bill 32 (Global Warming Solutions Act). The development of the MVGBC is identified in the Mountain View Environmental Sustainability Action Plan (ESAP) as an action to reduce greenhouse gases. The proposed MVGBC amendments include provisions that administer and improve energy efficiency, preserve natural resources, encourage the use of sustainable materials, manage waste and reduce other direct and indirect causes of climate change.

2. Limited Water Supply: The City finds that limited water supply is a local environmental condition. On October 31, 2008, the San Francisco Public Utilities Commission (SFPUC) made a unilateral decision to limit the water supply available from the San Francisco Regional Water System to the City of San Francisco and to the Bay Area Water Supply and Conservation Agency (BAWSCA) member agencies until at least 2018. The proposed MVGBC amendments include provisions that administer and improve outdoor and indoor water reduction.

3. Existing City Policy Addressing Local Environmental Conditions: The City finds that, as a result of local environmental conditions, other existing City policies have been incorporated into CalGreen by reference, such as storm water management and waste management.

ENVIRONMENTAL REVIEW

This ordinance is not subject to the California Environmental Quality Act (CEQA) pursuant to Section 15061(b)(1) as the project is statutorily exempt from CEQA under Section 15308, as it is an action by a regulatory agency for the protection of the environment and as it assures the maintenance, restoration, enhancement or protection of the environment where the regulatory process involves procedures for protection of the environment.

CONCLUSION

The proposed MVGBC was formed with key input from the Technical Advisory Group and meets the overall goal of the Phase II recommendations for maintaining regional consistency of green building standards across local jurisdictions within Santa Clara County. Staff believes that the MVGBC is enforceable, environmentally effective and not overly burdensome to the development community.

NEXT STEPS

If approved by the City Council, the next steps in this process include submitting a formal application to the CEC with the cost-effectiveness study and filing findings with the BSC for the proposed amendments. The improved energy requirements and Cost-Effectiveness Analysis must be approved by the CEC prior to the amendments becoming effective, and the approval process takes 45 to 90 days. Once the CEC approves the application, staff will return to the City Council for a second reading. Staff estimates the second reading will occur in June 2011 with a 30-day effective date following the second reading. No approval is necessary from the BSC.

OPTIONS

1. Modify any section or language within the proposed MVGBC ordinance.

2. Do not approve the proposed MVGBC ordinance and findings to the BSC.

PUBLIC NOTICING—Agenda posting.

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ND-LH-AG/5/CAM/896-03-22-11M-E^

Attachments:
1. Phase II Recommendations
2. City Council Study Session Staff Report—September 14, 2010
3. Study Session Minutes—September 14, 2010
4. Letter from SVLG
5. Ordinance—MVGBC Amendments
6. Cost-Effectiveness Analysis
7. Green Building Incremental Measure and Cost Analysis

Attachment 6

City of Mountain View

Energy Efficiency Reach Code
Cost Effectiveness Analysis

Prepared by:
Global Green USA
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March 13, 2011

Background

Public Resources Code Section 25402.1(h)2 and Section 10-106 of the Building Energy Efficiency Standards (Standards) establish a process that allows local adoption of energy standards that are more stringent than the statewide Standards. This process allows local governments to adopt and enforce energy standards before the statewide Standards effective date, require additional energy conservation measures, and/or set more stringent energy budgets. Because these energy standards "reach" beyond the minimum requirements of Title 24, Part 6 of the California Building Code, they are commonly referred to as Reach Codes.

The process for adopting a Reach Code requires that local governments apply to the California Energy Commission (CEC) for approval. As part of the application the applicant jurisdiction must prepare a Cost Effectiveness Study that provides the basis of the local government's determination that the proposed Reach Code Standards are cost-effective. Once the CEC staff has verified that the local Reach Code Standards will require buildings to use no more energy than the current statewide Standards and that the documentation requirements in Section 10-106 are met, the application is brought before the full California Energy Commission for approval.

Energy Efficiency Analysis Methodology

This Cost Effectiveness Study consists of an analysis of the building types and performance thresholds listed in Table 1. The 2008 Building Energy Efficiency Standards (2008 Standards), which became effective January 1, 2010, have been used as the baseline for calculating the energy performance of efficiency measures summarized in this study.

Table 1: Efficiency Thresholds Used in Cost-Effectiveness Study

Building Type	***Percentage Better than 2008 Title 24, Part 6***
Low-Rise Residential (3 stories and below)	15%
High-Rise Residential (4 stories and greater)	15%
Hotel/Motel	5%
Non-Residential Cold Shell (no HVAC, no lighting)	5%
Non-Residential Warm Shell (HVAC, no lighting)	7%
Non-Residential Full Build Out	10%
Non-residential lighting only	10%

In collaboration with City staff, a series of prototypical buildings for residential and non-residential construction were identified that represent building types constructed in the past five years in the City and building types that are predicted to be constructed in future years. The prototypes are shown in Table 2.

Table 2: Prototype Buildings		
Building Type	**Square Footage**	**Title 24 Standard**
Single-Family Residential	1,800	Low-Rise Res
Single-Family Residential	3,600	Low-Rise Res
Multi-Family Townhouse (8-unit)	12,000	Low-Rise Res
Multi-Family Apartment (80-unit)	100,000	High-Rise Res
Hotel (80-unit)	100,000	Hotel/Motel
Small Retail	4,000	Non-Res
Medium Retail	20,000	Non-Res
Large Retail	140,000	Non-Res
Medium Office	60,000	Non-Res
Large Office	160,000	Non-Res
Tenant Improvement Non-residential lighting only	20,000	Non-Res Lighting

For each prototype building, a mix of common efficiency measures was selected for a baseline condition (building achieving Title 24 compliance) and for a proposed condition consistent with the values in Table 1. The efficiency levels were established in consideration of the following:

1. other cities reach code thresholds;
2. maintaining consistency with statewide energy efficiency rebate programs;
3. maintaining consistency with the approach taken by LEED®[1] and Green Point Rated green building rating programs;
4. having achievable efficiency standards for projects permitted in the City; and
5. input from the energy modeling consultant on the feasibility of thresholds based on the model outputs.

The design choices to meet established performance thresholds were made in consultation with City staff with the intent of selecting typical construction strategies.

All buildings are modeled as square in plan, except the townhouse building, which is modeled as an elongated row of units. All low-rise residential buildings are modeled with the *prescriptive* compliance baseline of 20% glazing to floor area ratio, glazing equally distributed in each cardinal orientation, except for the townhouse building which has the 20% glazing allowance distributed 45% on each of the long walls, and 5% on each of the short walls. The high-rise residential building, hotel/motel building, and the office buildings are modeled with the *prescriptive* baseline of 40% glazing to wall ratio for each of the four cardinal oriented walls. The retail buildings are modeled with a 40% glazing to wall ratio (as retail buildings often only have glazing facing the front). To represent a worst case scenario the glazing was placed on the South-facing elevation. Skylights were only modeled for the large retail building– at 5% of the roof area.

The following tables indicate the baseline building efficiency measures included to meet the 2008 Standards (column 2, "Baseline") and the energy features that were modeled to enable the proposed design to use less energy (on a TDV basis) than the 2008 Standards (column 3, "Proposed"), in accordance with the Ordinance thresholds shown in Table 1. In addition to analyzing the impact of an array of efficiency measures that

[1] LEED is a trademark owned by the U.S. Green Building Council.

may be utilized to exceed Title 24, the building calculations include utility energy costs for baseline and efficient buildings based on the appropriate utility rate schedule for each building prototype.

City of Mountain View Reach Code - BUILDING PROTOTYPE STUDIES 2/24/11

1,800 SF Single Family House 2008 Title 24 (one-story)						
Measure	Baseline	Proposed (15%)	Notes	Incremental Cost Est.		
				min	max	avg
Fenestration Area (% of CFA) [1]	20%	20%		$0	$0	$0
Fenestration (U/SHGC) [2]	*.42/.42*	*.41/.41*	insignificant savings	$0	$0	$0
Roof Insulation	R-30	R-30		$0	$0	$0
Radiant Barrier [3]	yes	yes		$0	$0	$0
Walls	R-13	R-13		$0	$0	$0
Forced Air Unit (AFUE) [4]	*80%*	*90%*	$0.10-0.15 /sf increase [5]	$180	$270	$225
Duct Insulation	6	6		$0	$0	$0
HERS Duct Leakage Test [6]	yes	yes		$0	$0	$0
Air Conditioner (SEER) [7]	13	13		$0	$0	$0
HERS AC Test	no	no		$0	$0	$0
Domestic Hot Water Heater	*standard*	*tankless*	1 unit: ($1000 or $1100)-(500) [8,16]	$500	$600	$550
Quality Insulation Installation	no	no		$0	$0	$0
Incremental Construction Cost of Efficiency Measures				$680	$870	$775
Estimated Labor Costs (40%)				$272	$348	$310
Estimated Incremental Cost of Energy Efficient Measures (total)				**$952**	**$1,218**	**$1,085**
Incremental Cost of Efficiency Measures (per SF)				$0.53	$0.48	$0.43
Annual Energy Cost	$ 610	$ 509				
Energy Savings (annual)		$ 101				
Simple Payback (years)		**10.7**				
Net Savings/Cost (15 year)		$430				
Return on Investment		40%				
Annual ROI		3%				
Percent of Estimated Construction Cost		0.22%				

3,600 SF Single Family House 2008 Title 24 (two-story)						
Measure	Baseline	Proposed (15%)	Notes	Incremental Cost Est.		
				min	max	avg
Fenestration Area (% of CFA)	20%	20%		$0	$0	$0
Fenestration (U/SHGC)	.41/.42	.40/.40	insignificant savings	$0	$0	$0
Roof Insulation	R-30	R-30		$0	$0	$0
Radiant Barrier	yes	yes		$0	$0	$0
Walls	R-13	R-13		$0	$0	$0
Forced Air Unit (AFUE)	*80%*	*90%*	$0.10-0.15 /sf cost [5]	$360	$540	$450
Duct Insulation	6	6		$0	$0	$0
HERS Duct Leakage Test	yes	yes		$0	$0	$0
Air Conditioner (SEER)	*13*	*14*	$0.10-0.12 /sf cost [5]	$360	$432	$396
HERS AC Test	no	no		$0	$0	$0
Domestic Hot Water Heater	*standard*	*tankless*	1 unit: ($1000 or $1100)-(500) [8,16]	$500	$600	$550
Quality Insulation Installation	no	no		$0	$0	$0
Incremental Construction Cost of Efficiency Measures				$1,220	$1,572	$1,396
Estimated Labor Costs (40%)				$488	$629	$558
Estimated Incremental Cost of Energy Efficient Measures (total)				**$1,708**	**$2,201**	**$1,954**
Incremental Cost of Efficiency Measures (per SF)				$0.47	$0.44	$0.39
Annual Energy Cost	$ 804	$ 673				
Energy Savings (annual)		$ 131				
Simple Payback (years)		**14.9**				
Net Savings (15 year)		$ 11				
Return on Investment		1%				
Annual ROI		0%				
Percent of Estimated Construction Cost		0.27%				

12,000 SF 8 Unit Townhouse (two-story)						
Measure	Baseline	Proposed (15%)	Notes	Incremental Cost Est.		
				min	max	avg
Fenestration Area (% of CFA)	20%	20%		$0	$0	$0
Fenestration (U/SHGC)	.40/.40	.39/.40	insignificant savings	$0	$0	$0
Roof Insulation	R-30	R-30		$0	$0	$0
Radiant Barrier	yes	yes		$0	$0	$0
Walls	R-13	R-13		$0	$0	$0
Forced Air Unit (AFUE)	*95%*	*90%*	$0.05-0.075 /sf savings [5]	-$600	-$900	-$750
Duct Insulation	6	6		$0	$0	$0
HERS Duct Leakage Test	yes	yes		$0	$0	$0
Air Conditioner (SEER)	*16*	*14*	$0.20-0.24 /sf savings [5]	-$2,400	-$2,880	-$2,640
HERS AC Test	no	no		$0	$0	$0
Domestic Hot Water Heater	*standard*	*tankless*	8 units: ($1000 or $1100)-(600)[8,16]	$3,200	$4,000	$3,600
Quality Insulation Installation	no	no		$0	$0	$0
Incremental Construction Cost of Efficiency Measures				$200	$220	$210
Estimated Labor Costs (40%)				$80	$88	$84
Estimated Incremental Cost of Energy Efficient Measures (total)				**$280**	**$308**	**$294**
Incremental Cost of Efficiency Measures (per SF)				$0.02	$0.02	$0.02
Annual Energy Cost	$ 3,227	$ 2,693				
Energy Savings (annual)		$ 534				
Simple Payback (years)		**0.6**				
Net Savings (15 year)		$7,716				
Return on Investment		2624%				
Annual ROI		175%				
Percent of Estimated Construction Cost		0.01%				

100,000 SF 80-Unit Apartment Building (four-story)						
Measure	Baseline	Proposed (15%)	Notes	Incremental Cost Est.		
Fenestration Area (% of CFA)	40%	40%		$0	$0	$0
Roof Insulation	R-35	R-35		$0	$0	$0
Cool Roof	yes	yes		$0	$0	$0
Frame Walls	R-13 batt+R-5	R-13 batt+R-5		$0	$0	$0
Exposed Floor	R-8	R-8		$0	$0	$0
Fenestration (U/SHGC)	.79/.38	.47/.37	$1.30-$1.95/sf of window area [15]	$5,200	$7,800	$6,500
Skylights	no	no		$0	$0	$0
Fenestration Shading	no	no		$0	$0	$0
Space Heat Boiler	80%	90%	$0.03-0.05 /sf increase - [5]	$3,000	$5,000	$4,000
Duct Insulation	4.2	no (not exposed)	$0.10-0.15/sf savings [7]	-$10,000	-$15,000	-$12,500
DHW Water Boiler	80%	90%	$0.03-0.05 /sf increase - [5]	$3,000	$5,000	$4,000
Solar Thermal (25% offset)	no	yes		$25,000	$50,000	$37,500
Air Conditioner (SEER)	13	16		$0	$0	$0
Lighting Power	default	default		$0	$0	$0
Incremental Construction Cost of Efficiency Measures				$26,200	$52,800	$39,500
Estimated Labor Costs (40%)				$10,480	$21,120	$15,800
Estimated Incremental Cost of Energy Efficient Measures (total)				$36,680	$73,920	**$55,300**
Incremental Cost of Efficiency Measures (per SF)				$0.37	$0.53	$0.40
Annual Energy Cost	$ 77,367	$ 67,795				
Energy Savings (annual)		$ 9,572				
Simple Payback (years)		**5.8**				
Net Savings (15 year)		$88,280				
Return on Investment		160%				
Annual ROI		11%				
Percent of Estimated Construction Cost		0.28%				

140,000 SF Non-Residential (Retail) Building 2008 Title 24						
Measure	Baseline	Proposed (10%)	Notes	Incremental Cost Est.		
				min	max	avg
Roof Insulation	R-30	R-30		$0	$0	$0
Cool Roof (prescriptive std.)	yes	yes		$0	$0	$0
CMU Walls	No furring	No furring		$0	$0	$0
Fixed Storefront: Solarban 60/Clear Low-E dual-pane, SHGC 0.38	yes	yes		$0	$0	$0
Storefront Area: 40% of south wall area	yes	yes		$0	$0	$0
Skylights: Tint dual-pane, standard metal frame	1.11/0.57	.82/.49	$2.50-$3.75/sf of skylight area (3,500 sf.) [16]	$8,750	$13,125	$10,938
Fenestration Shading	no	yes	projection, s&w façades: $100-106 /sf [13]	$9,476	$10,045	$9,761
Package AC units (EER/AFUE)	11.2/80%	13.0/80%	$.64-$1.06 /sf increase [5]	$89,600	$148,400	$119,000
Lighting Power: prescriptive allowance 1.5 watts/SF	.091 W/SF	.763 W/SF	$0.05-$0.1/sf savings [5]	-$7,000	-$14,000	-$10,500
Automatic Daylighting Controls [14]	yes	yes		$0	$0	$0
Incremental Construction Cost of Efficiency Measures				$100,826	$157,570	$129,198
Estimated Labor Costs (40%)				$40,331	$63,028	$51,679
Estimated Incremental Cost of Energy Efficient Measures (total)				$141,157	$220,598	**$180,877**
Incremental Cost of Efficiency Measures (per SF)				$1.01	$1.58	$1.29
Annual Energy Cost	$ 179,306	$ 160,675				
Energy Savings (annual)		$ 18,631				
Simple Payback (years)		**9.7**				
Net Savings (15 year)		$98,588				
Return on Investment		55%				
Annual ROI		4%				
Percent of Estimated Construction Cost		0.65%				

4,000 SF Non-Residential (Retail) Building 2008 Title 24						
Measure	Baseline	Proposed (10%)	Notes	Incremental Cost Est.		
				min	max	avg
Roof Insulation	R-30	R-30		$0	$0	$0
Cool Roof (prescriptive std.)	yes	yes		$0	$0	$0
Wall Insulation (wood frame)	R-19	R-19		$0	$0	$0
Fixed Storefront: Solarban 60/Clear Low-E dual-pane, SHGC 0.38	yes	yes		$0	$0	$0
Storefront Area: 40% of south wall area	yes	yes		$0	$0	$0
Skylights: Tint dual-pane, standard metal frame	no	no		$0	$0	$0
Fenestration Shading	no	yes	projection: s&w facades, $100-106 /sf [13]	$3,896	$4,130	$4,013
Package AC units (EER/AFUE)	11.2/80%	13.0/80%	$.64-$1.06 /sf increase [5]	$2,560	$4,240	$3,400
Lighting Power: prescriptive allowance 1.5 watts/SF	1.095 W/SF	1.050 W/SF	$0.05-$0.1/sf [5]	-$200	-$400	-$300
Automatic Daylighting Controls [14]	yes	yes		$0	$0	$0
Incremental Construction Cost of Efficiency Measures				$6,256	$7,970	$7,113
Estimated Labor Costs (40%)				$2,502	$3,188	$2,845
Estimated Incremental Cost of Energy Efficient Measures (total)				$8,758	$11,158	**$9,958**
Incremental Cost of Efficiency Measures (per SF)				$2.19	$2.79	$2.49
Annual Energy Cost	$ 6,856	$ 6,259				
Energy Savings (annual)		$ 597				
Simple Payback (years)		**16.7**				
Net Savings (15 year)		-$1,003				
Return on Investment		-10%				
Annual ROI		-1%				
Percent of Estimated Construction Cost		0.89%				

20,000 SF Non-Residential (Retail) Building 2008 Title 24						
Measure	Baseline	Proposed (10%)	Notes	Incremental Cost Est.		
				min	max	avg
Roof Insulation	R-24	R-24		$0	$0	$0
Cool Roof (prescriptive std.)	yes	yes		$0	$0	$0
Wall Insulation (metal frame)	R-19 plus R-5	R-19 plus R-5		$0	$0	$0
Fixed Storefront: Solarban 60/Clear Low-E dual-pane, SHGC 0.38	yes	yes		$0	$0	$0
Storefront Area: 40% of south wall area	yes	yes		$0	$0	$0
Skylights: Tint dual-pane, standard metal frame	no	no		$0	$0	$0
Fenestration Shading	no	yes	projection, s&w facades: $100-106 /sf [13]	$5,826	$6,175	$6,001
Package AC units (EER/AFUE)	11.2/80%	13.0/80%	$.64-$1.06 /sf increase [5]	$12,800	$21,200	$17,000
Lighting Power: prescriptive allowance 1.5 watts/SF	1.10 W/SF	1.025 W/SF	$0.05-$0.1/sf [5]	-$1,000	-$2,000	-$1,500
Automatic Daylighting Controls [14]	yes	yes		$0	$0	$0
Incremental Construction Cost of Efficiency Measures				$17,626	$25,375	$21,501
Estimated Labor Costs (40%)				$7,050	$10,150	$8,600
Estimated Incremental Cost of Energy Efficient Measures (total)				$24,676	$35,526	**$30,101**
Incremental Cost of Efficiency Measures (per SF)				$1.23	$1.78	$1.51
Annual Energy Cost	$ 27,858	$ 25,385				
Energy Savings (annual)		$ 2,473				
Simple Payback (years)		**12.2**				
Net Savings (15 year)		$6,994				
Return on Investment		23%				
Annual ROI		2%				
Percent of Estimated Construction Cost		0.75%				

100,000 SF 80-Room Hotel Building (four-story)						
Measure	Baseline	Proposed (5%)	Notes	Incremental Cost Est.		
Fenestration Area (% of CFA)	40%	40%		$0	$0	$0
Roof Insulation	R-35	R-35		$0	$0	$0
Cool Roof	yes	yes		$0	$0	$0
Frame Walls	R-13 batt	R-13 batt		$0	$0	$0
Exposed Floor	R-8	R-8		$0	$0	$0
Fenestration (U/SHGC)	.79/.40	.47/.38	insignificant cost	$0	$0	$0
Skylights	no	no		$0	$0	$0
Fenestration Shading	no	yes	projection: s&w facades, $100-106 /sf [13]	$8,712	$9,234	$8,973
Duct Insulation	standard	standard		$0	$0	$0
DHW Water Boiler	80%	90%	$0.03-0.05 /sf increase - [5]	$3,000	$5,000	$4,000
Solar Thermal (25% offset)	no	no		$0	$0	$0
Common Area space conditioning	13 SEER	15 SEER	$0.10-0.15 /sf cost [5]	$500	$2,500	
Room Heating and Cooling	11 EER, 2.89 COP	12 EER, 3.2 COP	$0.10-0.15 /sf cost [5]	$9,500	$14,250	$11,875
Lighting Power	default	default		$0	$0	$0
Incremental Construction Cost of Efficiency Measures				$21,712	$30,984	$24,848
Estimated Labor Costs (40%)				$8,685	$12,394	$9,939
Estimated Incremental Cost of Energy Efficient Measures (total)				$30,396	$43,378	$34,787
Incremental Cost of Efficiency Measures (per SF)				$0.30	$0.31	$0.25
Annual Energy Cost	$ 87,901	$ 83,372				
Energy Savings (annual)		$ 4,529				
Simple Payback (years)		7.7				
Net Savings (15 year)		$33,148				
Return on Investment		95%				
Annual ROI		6%				
Percent of Estimated Construction Cost		0.17%				

60,000 SF Non-Residential (Office) Building 2008 Title 24						
Measure	Baseline	Proposed (10%)	Notes	Incremental Cost Est.		
				min	max	avg
Roof Insulation	R-19	R-30	$0.50-$1.00/sq.ft. of roof area [16]	$15,000	$30,000	$22,500
Cool Roof (prescriptive std.)	yes	yes		$0	$0	$0
Walls Insulation (wood frame)	R-19	R-19		$0	$0	$0
Fenestration	.77/.41	.77/.27	$1.30-$1.95/sf of window area [15]	$1,274	$1,911	$1,592
Skylights: Tint dual-pane, standard metal frame	no	no		$0	$0	$0
Fenestration Shading	no	yes	projection, s&w sides $100-106 /sf [13]	$6,260	$6,636	$6,448
Package AC units (EER/AFUE)	11.2/80%	13.0/80%	$.64-$1.06 /sf increase [5]	$38,400	$63,600	$51,000
Lighting Power: prescriptive allowance 1.5 watts/SF	.83 W/SF	.69 W/SF	$0.05-$0.1/sf savings [5]	-$3,000	-$6,000	-$4,500
Automatic Daylighting Controls [14]	yes	yes		$0	$0	$0
Incremental Construction Cost of Efficiency Measures				$57,934	$96,147	$77,040
Estimated Labor Costs (40%)				$23,174	$38,459	$30,816
Estimated Incremental Cost of Energy Efficient Measures (total)				$81,108	$134,605	$107,856
Incremental Cost of Efficiency Measures (per SF)				$1.35	$2.24	$1.80
Annual Energy Cost	$ 63,988	$ 57,879				
Energy Savings (annual)		$ 6,109				
Simple Payback (years)		17.7				
Net Savings (15 year)		-$16,221				
Return on Investment		-15%				
Annual ROI		-1%				
Percent of Estimated Construction Cost		0.90%				

160,000 SF Non-Residential (Office) Building 2008 Title 24						
Measure	Baseline	Proposed (10%)	Notes	Incremental Cost Est.		
				min	max	avg
Roof Insulation	R-20	R-30	$0.50-$1.00/sq.ft. of roof area [16]	$20,000	$40,000	$30,000
Cool Roof (prescriptive std.)	yes	yes		$0	$0	$0
Wall Insulation (metal frame)	R-19	R-19		$0	$0	$0
Fenestration	.77/.41	.77/.38	$1.30-$1.95/sf of window area [15]	$2,080	$3,120	$2,600
Skylights: Tint dual-pane, standard metal frame	no	no		$0	$0	$0
Fenestration Shading	no	no		$0	$0	$0
Package AC units (EER/AFUE)	11.2/80%	85% boiler, .95 kW/ton chiller		$100,000	$150,000	$125,000
Lighting Power: prescriptive allowance 1.5 watts/SF	.86 W/SF	.80 W/SF	$0.025-$0.05/sf savings [5]	-$4,000	-$8,000	-$6,000
Automatic Daylighting Controls [14]	yes	yes		$0	$0	$0
Incremental Construction Cost of Efficiency Measures				$118,080	$185,120	$151,600
Estimated Labor Costs (40%)				$47,232	$74,048	$60,640
Estimated Incremental Cost of Energy Efficient Measures (total)				$165,312	$259,168	$212,240
Incremental Cost of Efficiency Measures (per SF)				$1.03	$1.62	$1.33
Annual Energy Cost	$ 168,952	$ 137,607				
Energy Savings (annual)		$ 31,345				
Simple Payback (years)		6.8				
Net Savings (15 year)		$257,935				
Return on Investment		122%				
Annual ROI		8%				
Percent of Estimated Construction Cost		0.66%				

60,000 SF Non-Residential (Office) Building - Lighting Only 2008 Title 24						
Measure	Baseline	Proposed (10%)	Notes	Incremental Cost Est.		
				min	max	avg
Lighting Power: prescriptive allowance watts/SF	0.849	0.764	$0.025-$0.05/sf [5]	$1,500	$3,000	$2,250
Lamp Types Modeled	F32 T8	F28 T5		$0	$0	$0
Number of Fixtures	548	509	$20 - $25/fixture savings	-$780	-$975	-$878
Incremental Construction Cost of Efficiency Measures				$720	$2,025	$1,373
Estimated Labor Costs (40%)				$288	$810	$549
Estimated Incremental Cost of Energy Efficient Measures (total)				$1,008	$2,835	$1,922
Incremental Cost of Efficiency Measures (per SF)				$0.02	$0.05	$0.03
Annual Energy Cost	$ 60,626	$ 58,921				
Energy Savings (annual)		$ 1,705				
Simple Payback (years)		1.1				
Net Savings (15 year)		$23,654				
Return on Investment		1231%				
Annual ROI		82%				
Percent of Estimated Construction Cost		0.02%				

Cost Effectiveness Analysis

Once the energy efficiency measures were identified and the annual savings determined, estimates of the incremental cost of the various energy efficiency measures were completed for each of the prototype buildings. The savings and cost results were then used to determine the simple payback and return on investment. The main purpose of the cost-effectiveness analysis is to demonstrate the economic implications

of a reach code, rather that to determine whether the cost and savings meet a definitive standard established by the CEC.

Simple payback is the approach used for this analysis, as energy costs increases have been fairly consistent with increases in inflation for the past 25 years and is expected to continue to do so in the foreseeable future. Therefore the introduction of a discount rate, or cost of capital assumption, combined with an assumption of increases in energy costs, has limited net value in the analysis and the overall results. The CEC has verified that this approach is acceptable for cost-effectiveness studies.

The CEC has provided some guidance on cost-effectiveness determinations, stating that ideally the payback period for reach code requirements should be 30 years or less. A second reference for cost-effectiveness, commonly used in the energy efficiency industry, is that the additional cost can be recovered within the lifetime of the efficiency feature (insulation, windows, overhangs) or equipment (HVAC, hot water, lighting). Fifteen years is commonly used to represent the average effective life of energy upgrades, with equipment typically having the shorter life span of these categories (with 5-10 year warranties).

Table 3 below summarizes the payback period (in years) and the 15-year return on investment for the energy efficiency strategies required for the prototype buildings. Payback is a calculation of time, in years, that is required for an investment to "pay for itself" or be returned to the investor. Shorter payback periods are preferable to longer payback periods. Return on investment (ROI) is a performance measure used to evaluate the efficiency of an investment or to compare the efficiency of a number of different investments. A positive ROI generally connotes that the investment will return more than the value of the initial investment, while a negative ROI indicates that the value of the initial investment will not fully be returned within the investment period.

Table 3: Cost-Benefit Analysis Results

Building Type	Annual Savings	Upgrade Incremental Cost	Simple Payback (years)	15-Year ROI
Single-Family Residential (1,800 sq.ft.)	$101	$1,085	10.7	40%
Single-Family Residential (3,600 sq.ft.)	$131	$1,954	14.9	1%
Multi-Family Townhouse (8-unit)	$534	$294	.6	2624%
Multi-Family Apartment (80-unit)	$9,572	$55,300	5.8	160%
Hotel (80-unit)	$4,529	$34,787	7.7	95%
Retail (4,000 sq.ft.)	$597	$9,958	16.7	-10%
Retail (20,000 sq.ft.)	$2,473	$30,101	12.2	23%
Retail (140,000 sq.ft.)	$18,631	$180,877	9.7	98%
Office (60,000 sq.ft.)	$8,691	$107,856	17.7	-15%
Office (160,000 sq.ft.)	$31,345	$212,240	6.8	122%
Tenant Improvement Non-residential lighting only	$1,705	$1,922	1.1	1231%

Summary

The proposed Mountain View Reach Code cost-benefit analysis shows that all of the prototype buildings, except the small retail and the medium size office, have a payback of less than 15 years and a positive return on investment over a 15-year period. For small retail and medium size office prototypes, there is a 16.7 and 17.7-year simple payback, respectively, and a negative return on investment when using a 15-year analysis period. The degree to which the identified payback periods are acceptable to different property owners or developers is dependant on a number of factors including the sources of equity, ownership time horizon and overall investment strategy. However, these results are well within the 30-year range recommended by the California Energy Commission and are consistent with the general objective of the energy investment being returned within the average life of the materials, systems, and equipment.

Attachment 7

City of Mountain View

Green Building Incremental Measure and Cost Analysis

Prepared by:
Global Green USA

March 13, 2011

Background

At the request of the City of Mountain View Community Development Department, Global Green conducted an analysis of two development projects that were approved by the City within the past five years, to determine what aspects of the project design would need to be altered for the projects to meet the proposed green building ordinance.

The proposed ordinance augments existing City planning and building codes (including the State of California Cal Green code that went into effect on January 1, 2011). The purpose of the green building ordinance is to reduce resource use, create healthier living and working environments, reduce greenhouse gas emissions, and foster a consistent regulatory approach between the City of Mountain View and other public agencies in Santa Clara County.

The proposed green building ordinance requires that new development projects and substantial additions and tenant improvements meet the intent of the LEED®[1] green building rating system or, for residential projects, the Green Point Rated system.

This analysis was conducted for two recently permitted projects that are considered to be representative of future development:

- 220 View Street, an approximately 30,600 sq.ft. 22-unit multi-family development
- 331 Fairchild Drive, an approximately 87,100 sq.ft. commercial office development

The LEED® rating system was used for the analysis. A non-residential project must meet all seven prerequisites and earn at least 40 points to be eligible for certification. A residential project must meet all 19 prerequisites and earn at least 50 points to be able to earn certification.

Methodology

Global Green received the set of building plans for each project that was used for final permitting. The plans included architectural, civil engineering, mechanical, electrical, plumbing and landscape architecture. Global Green reviewed the plans to assess two levels of building performance:

1) the level of LEED® certification (if any) that the projects would be able to achieve based on the current design and specifications
2) what would need to be changed for the projects to comply with the minimum proposed standard of meeting the intent of LEED® at the Certified level

In reviewing the plans, Global Green used the current versions of the rating systems: LEED® for Building Design and Construction™ (V 3.0) and Homes™ (V 2008). The LEED® for Building Design and Construction™ was use for 331 Fairchild Drive. The LEED® for Homes™ for low-rise residential projects was used for 220 View Street.

[1] LEED is a trademark owned by the U.S. Green Building Council.

Each of the prerequisites and credits in the respective LEED® rating systems were reviewed and a determination was made on whether the plans and specifications provided sufficient documentation to meet the prerequisite or earn the credit. Building code requirements that went into effect on January 1, 2011, most notably the Cal Green code, were taken into consideration when making determinations about prerequisites and credits. A current LEED BD&C™ and Homes™ checklist was used to conduct and document the analysis. The LEED BD&C™ and Homes™ Reference Manuals were used to clarify specific credit criteria and determine the application to the specific projects.

Based on the above credit-by-credit analysis, a determination was made about the ability of the project as currently design to earn LEED® certification. The outcomes of this analysis became the base case for building in Mountain View. The next step was to identify which LEED® credits could be expanded (several credits offer a tiered point structure) or new credits added, to either enable the project to earn certification or to increase the level of certification.

Findings

Analysis of Current Design

Based on the plans and specifications neither project, as currently designed, would be able to achieve certification at even the lowest level of LEED®. Both projects are not in compliance with LEED® prerequisites in the areas of energy performance, mechanical system design, and field verification of proper building envelope and HVAC system installation. Neither of the projects achieved sufficient credits to be able to reach the threshold for the lowest level of LEED® certification. The results of the analysis of the current project design are summarized in Table 1 (See Attachment 1: 331 Fairchild Drive Current Design and Attachment 3: 220 View Street Current Design for more details).

Table 1: LEED Compliance Summary – Current Project Design		
	220 View Street Residential	**331 Fairchild Drive Non-Residential**
LEED® Rating System	Homes™	Building Design and Construction™
Prerequisites Required	19	8
Prerequisites Earned	*6*	*5*
Prerequisites Met	**No**	**No**
Points Required for Certification	44.5 (with home size adjustment)	40
Points Earned	*40.5*	*22*
Meets Intent of LEED	**No**	**No**

Modifications Needed to Meet Intent of LEED Certification

To be able to meet the intent of LEED® certification both projects would be required to improve energy performance to 15% better than the 2008 Building Energy Efficiency Standards in Title 24, Part 6. Energy performance better than code minimum is a LEED® prerequisite. This will require both additional design and the specification of a more energy efficient building envelope and systems. The landscape plans would also need to be modified to further reduce water use. Additional mechanical system design would also be required for both 220 View Street and 331 Fairchild Drive, in order to verify that LEED® Indoor Environmental Quality prerequisites are met.

To earn points for increased water efficiency, higher efficiency fixtures would need to be specified. Other upgrades that would be required are the specification of environmentally preferable building products, including recycled-content and locally manufactured materials and specifying mechanical equipment refrigerants that are free of HCFCs.

Both projects would also need to include stormwater management systems to capture and/or treat stormwater before it leaves the site. Increased construction and demolition waste diversion, an increase from 50% to 75% diversion, would also be required. The City currently has stormwater management and diversion requirements in place so achieving the LEED® prerequisites would be an augmentation of current practice, rather than the introduction of completely new requirements.

In construction, both projects would need to include additional construction verification measures. For 331 Fairchild Drive these would include additional commissioning, monitoring and verification of energy performance. For 220 View Street, the additional measures are the HERS (Home Energy Rating System) verifications that are included in the basic energy prerequisite: Quality Insulation Installation, Duct Leakage, and Refrigerant Charge. (See Attachment 2: 331 Fairchild Drive Certified Level and Attachment 4: 220 View Street Certified Level for more details).

Estimate Additional Costs

A summary of the estimated costs of the upgrades is provided in Table 2. The costs are based on assumptions for additional design time and field verification and the incremental cost of the energy system upgrades and environmentally preferable materials. Note that these costs are for design, construction, and field verification modifications only. The costs do not include the cost for preparing and submitting certification documentation to the U.S. Green Building Council, because the proposed ordinance does not require formal certification.

Table 2: Incremental Costs of Upgrades to Achieve Intent of LEED Certified

	220 View Street 30,600 sf. Residential	**331 Fairchild Drive 87,100 sf. Non-Residential**
Design[1]	$4,000	$10,000
Energy Systems[2]	$12,240	$100,165
Materials[3]	$15,600	$43,550
Construction Verification[4]	$1,000 (HERS)	$25,000 (Commissioning, M&V)

Verification[4]	(HERS)	(Commissioning, M&V)
Total Incremental Cost	**$32,840**	**$178,715**
Cost/Sq.Ft.[5]	**$1.07**	**$2.05**
Percent Cost Increase	**.5%**	**1%**

1. Assumes 40 and 100 hours at an average cost of $100/hr.
2. Based on Mountain View Energy Reach Code Cost-Effectiveness Study: $1.15/sf for non-res, $0.40/sf for residential
3. Assumes average incremental cost of $0.50/sq.ft.
4. Based on typical costs for current Global Green projects
5. Assumes $200 per square foot average cost of construction

Summary

It is feasible for both projects to meet the intent of LEED® certification through modifications to the current project design and additions to the construction monitoring and verification processes. The estimated incremental cost increases are consistent with incremental cost studies such as the Cost of Green Building Revisited (Davis Langdon, 2007) that determine that the incremental cost of achieving LEED® certification range from 0% to 5% of total construction costs, with most projects experiencing 3% or less of an increase in costs.

LEED 2009 for New Construction and Major Renovations

Project Checklist: 331 Fairchild Drive: Current Design

Project Name

Date

Sustainable Sites — Possible Points: 26

14	1	11

Y	?	N	d/c				Notes:
Y			c	Prereq 1	Construction Activity Pollution Prevention		Typical of SUSMP and SWIPPP requirements in Bay Area
1			d	Credit 1	Site Selection	1	Site is infill
5			d	Credit 2	Development Density and Community Connectivity	5	Site meets density requirements
1			d	Credit 3	Brownfield Redevelopment	1	Site is a brownfield
3		3	d	Credit 4.1	Alternative Transportation—Public Transportation Access	6	Site is close to NASA LRT station but has poor bus service.
1			d	Credit 4.2	Alternative Transportation—Bicycle Storage and Changing Rooms	1	18 spaces required. 14 lockers are provided, plus several bike racks.
		3	d	Credit 4.3	Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles	3	No special striping shown on plans.
		2	d	Credit 4.4	Alternative Transportation—Parking Capacity	2	Parking meets code but no special striping shown for vanpool.
		1	c	Credit 5.1	Site Development—Protect or Restore Habitat	1	N/A
		1	d	Credit 5.2	Site Development—Maximize Open Space	1	N/A
1			d	Credit 6.1	Stormwater Design—Quantity Control	1	Site has suficient space to meet this credit.
1			d	Credit 6.2	Stormwater Design—Quality Control	1	Site has suficient space to meet this credit.
		1	c	Credit 7.1	Heat Island Effect—Non-roof	1	Surace parking precludes the project from earning this credit.
1			d	Credit 7.2	Heat Island Effect—Roof	1	Cool roof is typical for this type of construction.
	1		d	Credit 8	Light Pollution Reduction	1	Likely but no information in the plans.

Water Efficiency — Possible Points: 10

2	0	6

Y	?	N					Notes:
Y			d	Prereq 1	Water Use Reduction—20% Reduction		Would be met via Cal Green
2			d	Credit 1	Water Efficient Landscaping	2 to 4	50% reduction is typical with California landscape codes.
					Y Reduce by 50%	2	
					No Potable Water Use or Irrigation	4	
		2	d	Credit 2	Innovative Wastewater Technologies	2	No on-site water treatment shown in plans.
		4	d	Credit 3	Water Use Reduction	2 to 4	
					Reduce by 30%	2	
					Reduce by 35%	3	
					Reduce by 40%	4	

Energy and Atmosphere — Possible Points: 35

0	0	35

Y	?	N					Notes:
Y			c	Prereq 1	Fundamental Commissioning of Building Energy Systems		Would be met via Cal Green
		N	d	Prereq 2	Minimum Energy Performance		No indication that the project would perform better than code
		N	d	Prereq 3	Fundamental Refrigerant Management		No indicatio of refrigerants that will be used.
		19	d	Credit 1	Optimize Energy Performance	1 to 19	No indication that the project would perform better than code
					Improve by 12% for New Buildings or 8% for Existing Building Renovations	1	
					Improve by 14% for New Buildings or 10% for Existing Building Renovations	2	
					Improve by 16% for New Buildings or 12% for Existing Building Renovations	3	
					Improve by 18% for New Buildings or 14% for Existing Building Renovations	4	
					Improve by 20% for New Buildings or 16% for Existing Building Renovations	5	
					Improve by 22% for New Buildings or 18% for Existing Building Renovations	6	
					Improve by 24% for New Buildings or 20% for Existing Building Renovations	7	
					Improve by 26% for New Buildings or 22% for Existing Building Renovations	8	
					Improve by 28% for New Buildings or 24% for Existing Building Renovations	9	
					Improve by 30% for New Buildings or 26% for Existing Building Renovations	10	
					Improve by 32% for New Buildings or 28% for Existing Building Renovations	11	
					Improve by 34% for New Buildings or 30% for Existing Building Renovations	12	
					Improve by 36% for New Buildings or 32% for Existing Building Renovations	13	
					Improve by 38% for New Buildings or 34% for Existing Building Renovations	14	
					Improve by 40% for New Buildings or 36% for Existing Building Renovations	15	
					Improve by 42% for New Buildings or 38% for Existing Building Renovations	16	
					Improve by 44% for New Buildings or 40% for Existing Building Renovations	17	
					Improve by 46% for New Buildings or 42% for Existing Building Renovations	18	
					Improve by 48%+ for New Buildings or 44%+ for Existing Building Renovations	19	
		7	d	Credit 2	On-Site Renewable Energy	1 to 7	No renewable energy shown on roof plans.
					1% Renewable Energy	1	
					3% Renewable Energy	2	
					5% Renewable Energy	3	
					7% Renewable Energy	4	
					9% Renewable Energy	5	
					11% Renewable Energy	6	
					13% Renewable Energy	7	
		2	c	Credit 3	Enhanced Commissioning	2	No mention in plans or general section of specifications.
		2	d	Credit 4	Enhanced Refrigerant Management	2	No mention in plans or general section of specifications.
		3	c	Credit 5	Measurement and Verification	3	No mention in plans or general section of specifications.
		2	c	Credit 6	Green Power	2	N/A

1	0	13			**Materials and Resources**	**Possible Points: 14**	
Y	?	N					Notes:
Y			d	Prereq 1	Storage and Collection of Recyclables		Dumpster location shown on plans.
		3	c	Credit 1.1	Building Reuse—Maintain Existing Walls, Floors, and Roof	1 to 3	N/A
					Reuse 55%	1	
					Reuse 75%	2	
					Reuse 95%	3	
		1	c	Credit 1.2	Building Reuse—Maintain 50% of Interior Non-Structural Elements	1	N/A
1		1	c	Credit 2	Construction Waste Management	1 to 2	
					Y 50% Recycled or Salvaged	1	Local code requirement.
					75% Recycled or Salvaged	2	
		2	c	Credit 3	Materials Reuse	1 to 2	No specifications address this subject.
					Reuse 5%	1	
					Reuse 10%	2	
		2	c	Credit 4	Recycled Content	1 to 2	No specifications address this subject.
					10% of Content	1	
					20% of Content	2	
		2	c	Credit 5	Regional Materials	1 to 2	No specifications address this subject.
					10% of Materials	1	
					20% of Materials	2	
		1	c	Credit 6	Rapidly Renewable Materials	1	No specifications address this subject.
		1	c	Credit 7	Certified Wood	1	No specifications address this subject.

4	4	7			**Indoor Environmental Quality**	**Possible Points: 15**	
Y	?	N					Notes:
	Y		d	Prereq 1	Minimum Indoor Air Quality Performance		Likely but no reference to ASHRAE standards and no calcs provided.
Y			d	Prereq 2	Environmental Tobacco Smoke (ETS) Control		State Law
		1	d	Credit 1	Outdoor Air Delivery Monitoring	1	No mention in plans or specifications.
		1	d	Credit 2	Increased Ventilation	1	No mention in plans or specifications.
	1		c	Credit 3.1	Construction IAQ Management Plan—During Construction	1	Likely but no reference in plans or specs.
		1	c	Credit 3.2	Construction IAQ Management Plan—Before Occupancy	1	No mention in plans or specifications.
1			c	Credit 4.1	Low-Emitting Materials—Adhesives and Sealants	1	Per Cal Green
1			c	Credit 4.2	Low-Emitting Materials—Paints and Coatings	1	Per Cal Green
1			c	Credit 4.3	Low-Emitting Materials—Flooring Systems	1	Per Cal Green
1			c	Credit 4.4	Low-Emitting Materials—Composite Wood and Agrifiber Products	1	Per Cal Green
		1	d	Credit 5	Indoor Chemical and Pollutant Source Control	1	No mention in mechanical plans or specifications.
	1		d	Credit 6.1	Controllability of Systems—Lighting	1	Possible but analysis consistemt with LEED not provided.
	1		d	Credit 6.2	Controllability of Systems—Thermal Comfort	1	Possible but analysis consistemt with LEED not provided.
		1	d	Credit 7.1	Thermal Comfort—Design	1	No mention of ASHRAE 55 standard in plans or specs.
		1	d	Credit 7.2	Thermal Comfort—Verification	1	No mention in mechanical plans or specifications.
		1	d	Credit 8.1	Daylight and Views—Daylight	1	No mention and no calculation provided.
	1		d	Credit 8.2	Daylight and Views—Views	1	Likely but no reference in plans or specs and no calcs provided.

1	0	5			**Innovation and Design Process**	**Possible Points: 6**	
Y	?	N					Notes:
		1	d/C	Credit 1.1	Innovation in Design: Specific Title	1	No mention in plans or specs. No innovative aspects to project.
		1	d/C	Credit 1.2	Innovation in Design: Specific Title	1	
		1	d/C	Credit 1.3	Innovation in Design: Specific Title	1	
		1	d/C	Credit 1.4	Innovation in Design: Specific Title	1	
		1	d/C	Credit 1.5	Innovation in Design: Specific Title	1	
1			d/C	Credit 2	LEED Accredited Professional	1	Member of architecture firm is LEED AP

0	0	4			**Regional Priority Credits**	**Possible Points: 4**	
Y	?	N					Notes:
		1	d/C	Credit 1.1	Regional Priority: Specific Credit	1	No mention in plans or specs. No regionally unique aspects.
		1	d/C	Credit 1.2	Regional Priority: Specific Credit	1	
		1	d/C	Credit 1.3	Regional Priority: Specific Credit	1	
		1	d/C	Credit 1.4	Regional Priority: Specific Credit	1	

22	5	81	**Total**	**Possible Points: 110**

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110

LEED 2009 for New Construction and Major Renovations

Project Checklist: 331 Fairchild Drive Certified

Project Name

Date

Sustainable Sites — Possible Points: 26

17	0	9

Y	?	N	d/c				Notes:
Y			c	Prereq 1	Construction Activity Pollution Prevention		Typical of SUSMP and SWIPPP requirements in Bay Area
1			d	Credit 1	Site Selection	1	Site is infill
5			d	Credit 2	Development Density and Community Connectivity	5	Site meets density requirements
1			d	Credit 3	Brownfield Redevelopment	1	Site is a brownfield
3		3	d	Credit 4.1	Alternative Transportation—Public Transportation Access	6	Site is close to NASA LRT station but has poor bus service.
1			d	Credit 4.2	Alternative Transportation—Bicycle Storage and Changing Rooms	1	18 spaces required. 14 lockers are provided, plus several bike racks.
		3	d	Credit 4.3	Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles	3	No special striping shown on plans.
2			d	Credit 4.4	Alternative Transportation—Parking Capacity	2	Can be accomplished through parking lot striping.
		1	c	Credit 5.1	Site Development—Protect or Restore Habitat	1	N/A
		1	d	Credit 5.2	Site Development—Maximize Open Space	1	N/A
1			d	Credit 6.1	Stormwater Design—Quantity Control	1	Site has suficient space to meet this credit.
1			d	Credit 6.2	Stormwater Design—Quality Control	1	Site has suficient space to meet this credit.
		1	c	Credit 7.1	Heat Island Effect—Non-roof	1	Surace parking precludes the project from earning this credit.
1			d	Credit 7.2	Heat Island Effect—Roof	1	Cool roof is typical for this type of construction.
1			d	Credit 8	Light Pollution Reduction	1	Can be accomplished by specifying cut-of fixtures.

Water Efficiency — Possible Points: 10

4	0	6

Y	?	N					Notes:
Y			d	Prereq 1	Water Use Reduction—20% Reduction		Would be met via Cal Green
2		2	d	Credit 1	Water Efficient Landscaping	2 to 4	
				Y	Reduce by 50%	2	
					No Potable Water Use or Irrigation	4	
		2	d	Credit 2	Innovative Wastewater Technologies	2	No on-site water treatment shown in plans.
2		2	d	Credit 3	Water Use Reduction	2 to 4	
				Y	Reduce by 30%	2	Provide waterless urinals
					Reduce by 35%	3	
					Reduce by 40%	4	

Energy and Atmosphere — Possible Points: 35

9	3	23

Y	?	N					Notes:
N			c	Prereq 1	Fundamental Commissioning of Building Energy Systems		
Y			d	Prereq 2	Minimum Energy Performance		Upgrade envelope and systems to be 10% better than 2005 T24.
Y			d	Prereq 3	Fundamental Refrigerant Management		Use only HCFC-free refrigerants.
5		14	d	Credit 1	Optimize Energy Performance	1 to 19	Upgrade envelope and systems to be 16% better than 2005 T24.
					Improve by 12% for New Buildings or 8% for Existing Building Renovations	1	
					Improve by 14% for New Buildings or 10% for Existing Building Renovations	2	
					Improve by 16% for New Buildings or 12% for Existing Building Renovations	3	
					Improve by 18% for New Buildings or 14% for Existing Building Renovations	4	
				Y	Improve by 20% for New Buildings or 16% for Existing Building Renovations	5	
					Improve by 22% for New Buildings or 18% for Existing Building Renovations	6	
					Improve by 24% for New Buildings or 20% for Existing Building Renovations	7	
					Improve by 26% for New Buildings or 22% for Existing Building Renovations	8	
					Improve by 28% for New Buildings or 24% for Existing Building Renovations	9	
					Improve by 30% for New Buildings or 26% for Existing Building Renovations	10	
					Improve by 32% for New Buildings or 28% for Existing Building Renovations	11	
					Improve by 34% for New Buildings or 30% for Existing Building Renovations	12	
					Improve by 36% for New Buildings or 32% for Existing Building Renovations	13	
					Improve by 38% for New Buildings or 34% for Existing Building Renovations	14	
					Improve by 40% for New Buildings or 36% for Existing Building Renovations	15	
					Improve by 42% for New Buildings or 38% for Existing Building Renovations	16	
					Improve by 44% for New Buildings or 40% for Existing Building Renovations	17	
					Improve by 46% for New Buildings or 42% for Existing Building Renovations	18	
					Improve by 48%+ for New Buildings or 44%+ for Existing Building Renovations	19	
		7	d	Credit 2	On-Site Renewable Energy	1 to 7	
					1% Renewable Energy	1	
					3% Renewable Energy	2	
					5% Renewable Energy	3	
					7% Renewable Energy	4	
					9% Renewable Energy	5	
					11% Renewable Energy	6	
					13% Renewable Energy	7	
2			c	Credit 3	Enhanced Commissioning	2	Could be added to Cal Green required commissioning
2			d	Credit 4	Enhanced Refrigerant Management	2	Use HCFC-free refrigerants
	3		c	Credit 5	Measurement and Verification	3	Could be added to commissioning agents scope.
		2	c	Credit 6	Green Power	2	N/A

Materials and Resources — Possible Points: 14

Y	?	N					Notes:
4	2	8					
Y			d	Prereq 1	Storage and Collection of Recyclables		
		3	c	Credit 1.1	Building Reuse—Maintain Existing Walls, Floors, and Roof	1 to 3	
					Reuse 55%	1	
					Reuse 75%	2	
					Reuse 95%	3	
		1	c	Credit 1.2	Building Reuse—Maintain 50% of Interior Non-Structural Elements	1	
2			c	Credit 2	Construction Waste Management	1 to 2	
					50% Recycled or Salvaged	1	
				Y	75% Recycled or Salvaged	2	Of site sorting of mixed bin results in approx. 85% diversion.
		2	c	Credit 3	Materials Reuse	1 to 2	No specifications address this subject.
					Reuse 5%	1	
					Reuse 10%	2	
1		1	c	Credit 4	Recycled Content	1 to 2	Modify specifications to meet LEED criteria.
				1	10% of Content	1	
					20% of Content	2	
1		1	c	Credit 5	Regional Materials	1 to 2	Modify specifications to meet LEED criteria.
				1	10% of Materials	1	
					20% of Materials	2	
	1		c	Credit 6	Rapidly Renewable Materials	1	Specifications could be modified to address this subject.
	1		c	Credit 7	Certified Wood	1	Specifications could be modified to address this subject.

Indoor Environmental Quality — Possible Points: 15

Y	?	N					Notes:
6	4	5					
	Y		d	Prereq 1	Minimum Indoor Air Quality Performance		Likely but no reference to ASHRAE standards and no calcs provided.
Y			d	Prereq 2	Environmental Tobacco Smoke (ETS) Control		State Law
		1	d	Credit 1	Outdoor Air Delivery Monitoring	1	No mention in plans or specifications.
		1	d	Credit 2	Increased Ventilation	1	No mention in plans or specifications.
1			c	Credit 3.1	Construction IAQ Management Plan—During Construction	1	Can be added to contractor requirements
1			c	Credit 3.2	Construction IAQ Management Plan—Before Occupancy	1	Can be added to contractor requirements
1			c	Credit 4.1	Low-Emitting Materials—Adhesives and Sealants	1	Per Cal Green
1			c	Credit 4.2	Low-Emitting Materials—Paints and Coatings	1	Per Cal Green
1			c	Credit 4.3	Low-Emitting Materials—Flooring Systems	1	Per Cal Green
1			c	Credit 4.4	Low-Emitting Materials—Composite Wood and Agrifiber Products	1	Per Cal Green
	1		d	Credit 5	Indoor Chemical and Pollutant Source Control	1	No mention in mechanical plans or specifications.
	1		d	Credit 6.1	Controllability of Systems—Lighting	1	Possible but would require modification of electrical plans.
	1		d	Credit 6.2	Controllability of Systems—Thermal Comfort	1	Possible but would require modification of mechanical plans.
		1	d	Credit 7.1	Thermal Comfort—Design	1	No mention of ASHRAE 55 standard in plans or specs.
		1	d	Credit 7.2	Thermal Comfort—Verification	1	No mention in mechanical plans or specifications.
		1	d	Credit 8.1	Daylight and Views—Daylight	1	No mention and no calculation provided.
	1		d	Credit 8.2	Daylight and Views—Views	1	Likely but no reference in plans or specs and no calcs provided.

Innovation and Design Process — Possible Points: 6

Y	?	N					Notes:
1	0	5					
		1	d/C	Credit 1.1	Innovation in Design: Specific Title	1	No mention in plans or specs. No innovative aspects to project.
		1	d/C	Credit 1.2	Innovation in Design: Specific Title	1	
		1	d/C	Credit 1.3	Innovation in Design: Specific Title	1	
		1	d/C	Credit 1.4	Innovation in Design: Specific Title	1	
		1	d/C	Credit 1.5	Innovation in Design: Specific Title	1	
1			d/C	Credit 2	LEED Accredited Professional	1	Member of architecture firm is LEED AP

Regional Priority Credits — Possible Points: 4

Y	?	N					Notes:
0	0	4					
		1	d/C	Credit 1.1	Regional Priority: Specific Credit	1	No mention in plans or specs. No regionally unique aspects.
		1	d/C	Credit 1.2	Regional Priority: Specific Credit	1	
		1	d/C	Credit 1.3	Regional Priority: Specific Credit	1	
		1	d/C	Credit 1.4	Regional Priority: Specific Credit	1	

Total — Possible Points: 110

41	9	60

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110

LEED for Homes Simplified Project Checklist for California

for Homes

Builder Name:	*220 View Street - Current Design*
Project Team Leader (if different):	
Home Address (Street/City/State):	*, Mountain View, CA*

Project Description:

Building type: *Multi-family* Project type: *Custom*

# of units: *22* Avg. Home Size Adjustment: *-0.5*

Adjusted Certification Thresholds

Certified: *44.5* Gold: *74.5*

Silver: *59.5* Platinum: *89.5*

Project Point Total

Prelim: *40.5 + 0 maybe pts* Final: *6.5*

Certification Level

Prelim: *Not Certified* Final: *Not Certified*

Final Credit Category Total Points

ID: 0 SS 5 EA: 0 EQ: 0

LL: 0 WE 0 MR: 1.5 AE: 0

Min. Point Thresholds Not Met for Prelim. OR Final Rating

date last updated :

last updated by :

				Max Points	Project Points Preliminary			Final
Innovation and Design Process (ID)		(No Minimum Points Required)		Max	Y/Pts	Maybe	No	Y/Pts
1. Integrated Project Planning	1.1	Preliminary Rating		Prereq	Y			
	1.2	Integrated Project Team		1	1	0		0
	1.3	Professional Credentialed with Respect to LEED for Homes		1	0	0		0
	1.4	Design Charrette		1	0	0		0
	1.5	Building Orientation for Solar Design		1	0	0		0
2. Durability Management Process	2.1	Durability Planning		Prereq			N	
	2.2	Durability Management		Prereq			N	
	2.3	Third-Party Durability Management Verification		3	0	0		
3.Innovative or Regional Design	3.1	Innovation #1 _____		1	0	0		0
	3.2	Innovation #2 _____		1	0	0		0
	3.3	Innovation #3 _____		1	0	0		0
	3.4	Innovation #4 _____		1	0	0		0
			Sub-Total for ID Category:	11	1	0		0
Location and Linkages (LL)		(No Minimum Points Required)	*OR*	Max	Y/Pts	Maybe	No	Y/Pts
1. LEED ND	1	LEED for Neighborhood Development	LL2-6	10	0	0		0
2. Site Selection	2	Site Selection		2	2	0		0
3. Preferred Locations	3.1	Edge Development	LL 3.2	1	0	0		0
	3.2	Infill		2	2	0		0
	3.3	Previously Developed		1	1	0		0
4. Infrastructure	4	Existing Infrastructure		1	1	0		0
5. Community Resources/ Transit	5.1	Basic Community Resources / Transit	LL 5.2, 5.3	1	0	0		0
	5.2	Extensive Community Resources / Transit	LL 5.3	2	0	0		0
	5.3	Outstanding Community Resources / Transit		3	3	0		0
6. Access to Open Space	6	Access to Open Space		1	1	0		0
			Sub-Total for LL Category:	10	10	0		0
Sustainable Sites (SS)		(Minimum of 5 SS Points Required)	*OR*	Max	Y/Pts	Maybe	No	Y/Pts
1. Site Stewardship	1.1	Erosion Controls During Construction		Prereq	Y			
	1.2	Minimize Disturbed Area of Site		1	1	0		0
2. Landscaping	2.1	No Invasive Plants		Prereq		M		
	2.2	Basic Landscape Design	SS 2.5	2	2	0		0
	2.3	Limit Conventional Turf	SS 2.5	3	3	0		3
	2.4	Drought Tolerant Plants	SS 2.5	2	2	0		2
	2.5	Reduce Overall Irrigation Demand by at Least 20%		6	0	0		0
3. Local Heat Island Effects	3	Reduce Local Heat Island Effects		1	0	0		0
4. Surface Water Management	4.1	Permeable Lot		4	0	0		0
	4.2	Permanent Erosion Controls		1	0	0		0
	4.3	Management of Run-off from Roof		2	0	0		0
5. Nontoxic Pest Control	5	Pest Control Alternatives		2	1	0		0
6. Compact Development	6.1	Moderate Density	SS 6.2, 6.3	2	0	0		0
	6.2	High Density	SS 6.3	3	0	0		0
	6.3	Very High Density		4	4	0		0
			Sub-Total for SS Category:	22	13	0		5

LEED for Homes Simplified Project Checklist for California (continued)

				Max Points	Project Points Preliminary			Final
Water Efficiency (WE)		(Minimum of 3 WE Points Required)	OR	Max	Y/Pts	Maybe	No	Y/Pts
1. Water Reuse	1.1	Rainwater Harvesting System	WE 1.3	4	0	0		0
	1.2	Graywater Reuse System	WE 1.3	1	0	0		0
	1.3	Use of Municipal Recycled Water System		3	0	0		0
2. Irrigation System	2.1	High Efficiency Irrigation System	WE 2.3	3	3	0		0
	2.2	Third Party Inspection	WE 2.3	1	0	0		0
	2.3	Reduce Overall Irrigation Demand by at Least 45%		4	0	0		0
3. Indoor Water Use	3.1	High-Efficiency Fixtures and Fittings		3	3	0		0
	3.2	Very High Efficiency Fixtures and Fittings		6	0	0		0
			Sub-Total for WE Category:	**15**	6	0		0
Energy and Atmosphere (EA)		(Minimum of 0 EA Points Required)	OR	Max	Y/Pts	Maybe	No	Y/Pts
1. Optimize Energy Performance in California	1.1	Performance of ENERGY STAR for Homes		Prereq			N	
	1.2	Exceptional Energy Performance		19	0	0		0
7. Water Heating	7	Efficient Hot Water Distribution		2	0	0		0
8. Lighting	8.1	Title-24 Lighting		Prereq	Y			
	8.2	Improved Lighting	EA 8.3	1	0	0		0
	8.3	Advanced Lighting		3	0	0		0
9. Appliances	9.1	High-Efficiency Appliances		2	1	0		0
	9.2	Water-Efficient Clothes Washer		1	1	0		0
10. Renewable Energy in CA	10	Renewable Energy System		10	0	0		0
11. Residential Refrigerant Management	11.1	Refrigerant Charge Test		Prereq			N	
	11.2	Appropriate HVAC Refrigerants		1	0	0		0
			Sub-Total for EA Category:	**38**	2	0		0
Materials and Resources (MR)		(Minimum of 2 MR Points Required)	OR	Max	Y/Pts	Maybe	No	Y/Pts
1. Material-Efficient Framing	1.1	Framing Order Waste Factor Limit		Prereq		M		
	1.2	Detailed Framing Documents	MR 1.5	1	1	0		0
	1.3	Detailed Cut List and Lumber Order	MR 1.5	1	1	0		0
	1.4	Framing Efficiencies	MR 1.5	3	0	0		0
	1.5	Off-site Fabrication		4	0	0		0
2. Environmentally Preferable Products	2.1	FSC Certified Tropical Wood		Prereq		M		
	2.2	Environmentally Preferable Products		8	0	0		0
3. Waste Management	3.1	Construction Waste Management Planning		Prereq	Y			
	3.2	Construction Waste Reduction		3	1.5	0		1.5
			Sub-Total for MR Category:	**16**	3.5	0		1.5

LEED for Homes Simplified Project Checklist for California (continued)

				Max Points	Project Points Preliminary			Final
Indoor Environmental Quality (EQ)		(Minimum of 6 EQ Points Required)	OR	Max	Y/Pts	Maybe	No	Y/Pts
1. ENERGY STAR with IAP	1	ENERGY STAR with Indoor Air Package		13	0	0		0
2. Combustion Venting	2.1	Basic Combustion Venting Measures	EQ 1	Prereq	Y			
	2.2	Enhanced Combustion Venting Measures	EQ 1	2	2	0		0
3. Moisture Control	3	Moisture Load Control	EQ 1	1	0	0		0
4. Outdoor Air Ventilation	4.1	Basic Outdoor Air Ventilation	EQ 1	Prereq			N	
	4.2	Enhanced Outdoor Air Ventilation		2	0	0		0
	4.3	Third-Party Performance Testing	EQ 1	1	0	0		0
5. Local Exhaust	5.1	Basic Local Exhaust	EQ 1	Prereq			N	
	5.2	Enhanced Local Exhaust		1	0	0		0
	5.3	Third-Party Performance Testing		1	0	0		0
6. Distribution of Space Heating and Cooling	6.1	Room-by-Room Load Calculations	EQ 1	Prereq		M		
	6.2	Return Air Flow / Room by Room Controls	EQ 1	1	0	0		0
	6.3	Third-Party Performance Test / Multiple Zones	EQ 1	2	0	0		0
7. Air Filtering	7.1	Good Filters	EQ 1	Prereq		M		
	7.2	Better Filters	EQ 7.3	1	0	0		0
	7.3	Best Filters		2	0	0		0
8. Contaminant Control	8.1	Indoor Contaminant Control during Construction	EQ 1	1	1	0		0
	8.2	Indoor Contaminant Control		2	0	0		0
	8.3	Preoccupancy Flush	EQ 1	1	0	0		0
9. Radon Protection	9.1	Radon-Resistant Construction in High-Risk Areas	EQ 1	Prereq	N/A			
	9.2	Radon-Resistant Construction in Moderate-Risk Areas	EQ 1	1	0	0		0
10. Garage Pollutant Protection	10.1	No HVAC in Garage	EQ 1	Prereq	Y			
	10.2	Minimize Pollutants from Garage	EQ 1, 10.4	2	2	0		0
	10.3	Exhaust Fan in Garage	EQ 1, 10.4	1	0	0		0
	10.4	Detached Garage or No Garage	EQ 1	3	0	0		0
			Sub-Total for EQ Category:	**21**	5	0		0
Awareness and Education (AE)		(Minimum of 0 AE Points Required)		Max	Y/Pts	Maybe	No	Y/Pts
1. Education of the Homeowner or Tenant	1.1	Basic Operations Training		Prereq		M		
	1.2	Enhanced Training		1	0	0		0
	1.3	Public Awareness		1	0	0		0
2. Education of Building Manager	2	Education of Building Manager		1	0	0		0
			Sub-Total for AE Category:	**3**	0	0		0

Attachment 4

LEED for Homes Simplified Project Checklist for California

for Homes

Builder Name:	*220 View Street - Certified*
Project Team Leader (if different):	
Home Address (Street/City/State):	*, Mountain View, CA*

Project Description:

Building type: *Multi-family*
# of units: *22*
Project type: *Custom*
Avg. Home Size Adjustment: *-0.5*

Adjusted Certification Thresholds

Certified: *44.5* Gold: *74.5*
Silver: *59.5* Platinum: *89.5*

Project Point Total
Prelim: *53 + 0 maybe pts* Final: *7.5*

Certification Level
Prelim: *Certified* Final: *Not Certified*

Final Credit Category Total Points
ID: 0 SS 5 EA: 0 EQ: 0
LL: 0 WE 0 MR: 2.5 AE: 0
Minimum Point Thresholds Not Met for Final Rating

date last updated :
last updated by :

				Max Points	Project Points Preliminary Y/Pts	Maybe	No	Final Y/Pts
Innovation and Design Process (ID)		(No Minimum Points Required)		Max				
1. Integrated Project Planning	1.1	Preliminary Rating		Prereq	Y			
	1.2	Integrated Project Team		1	1	0		0
	1.3	Professional Credentialed with Respect to LEED for Homes		1	0	0		0
	1.4	Design Charrette		1	0	0		0
	1.5	Building Orientation for Solar Design		1	0	0		0
2. Durability Management Process	2.1	Durability Planning		Prereq	Y			
	2.2	Durability Management		Prereq	Y			
	2.3	Third-Party Durability Management Verification		3	0	0		
3.Innovative or Regional Design	3.1	Innovation #1 _____		1	0	0		0
	3.2	Innovation #2 _____		1	0	0		0
	3.3	Innovation #3 _____		1	0	0		0
	3.4	Innovation #4 _____		1	0	0		0
			Sub-Total for ID Category:	11	1	0		0
Location and Linkages (LL)		(No Minimum Points Required)	OR	Max	Y/Pts	Maybe	No	Y/Pts
1. LEED ND	1	LEED for Neighborhood Development	LL2-6	10	0	0		0
2. Site Selection	2	Site Selection		2	2	0		0
3. Preferred Locations	3.1	Edge Development	LL 3.2	1	0	0		0
	3.2	Infill		2	2	0		0
	3.3	Previously Developed		1	1	0		0
4. Infrastructure	4	Existing Infrastructure		1	1	0		0
5. Community Resources/ Transit	5.1	Basic Community Resources / Transit	LL 5.2, 5.3	1	0	0		0
	5.2	Extensive Community Resources / Transit	LL 5.3	2	0	0		0
	5.3	Outstanding Community Resources / Transit		3	3	0		0
6. Access to Open Space	6	Access to Open Space		1	1	0		0
			Sub-Total for LL Category:	10	10	0		0
Sustainable Sites (SS)		(Minimum of 5 SS Points Required)	OR	Max	Y/Pts	Maybe	No	Y/Pts
1. Site Stewardship	1.1	Erosion Controls During Construction		Prereq	Y			
	1.2	Minimize Disturbed Area of Site		1	1	0		0
2. Landscaping	2.1	No Invasive Plants		Prereq	Y			
	2.2	Basic Landscape Design	SS 2.5	2	2	0		0
	2.3	Limit Conventional Turf	SS 2.5	3	3	0		3
	2.4	Drought Tolerant Plants	SS 2.5	2	2	0		2
	2.5	Reduce Overall Irrigation Demand by at Least 20%		6	0	0		0
3. Local Heat Island Effects	3	Reduce Local Heat Island Effects		1	0	0		0
4. Surface Water Management	4.1	Permeable Lot		4	0	0		0
	4.2	Permanent Erosion Controls		1	0	0		0
	4.3	Management of Run-off from Roof		2	1	0		0
5. Nontoxic Pest Control	5	Pest Control Alternatives		2	1.5	0		0
6. Compact Development	6.1	Moderate Density	SS 6.2, 6.3	2	0	0		0
	6.2	High Density	SS 6.3	3	0	0		0
	6.3	Very High Density		4	4	0		0
			Sub-Total for SS Category:	22	14.5	0		5

LEED for Homes Simplified Project Checklist for California (continued)

				Max Points	Project Points Preliminary			Final
Water Efficiency (WE)		(Minimum of 3 WE Points Required)	OR	Max	Y/Pts	Maybe	No	Y/Pts
1. Water Reuse	1.1	Rainwater Harvesting System	WE 1.3	4	0	0		0
	1.2	Graywater Reuse System	WE 1.3	1	0	0		0
	1.3	Use of Municipal Recycled Water System		3	0	0		0
2. Irrigation System	2.1	High Efficiency Irrigation System	WE 2.3	3	3	0		0
	2.2	Third Party Inspection	WE 2.3	1	0	0		0
	2.3	Reduce Overall Irrigation Demand by at Least 45%		4	0	0		0
3. Indoor Water Use	3.1	High-Efficiency Fixtures and Fittings		3	1	0		0
	3.2	Very High Efficiency Fixtures and Fittings		6	4	0		0
			Sub-Total for WE Category:	**15**	8	0		0
Energy and Atmosphere (EA)		(Minimum of 0 EA Points Required)	OR	Max	Y/Pts	Maybe	No	Y/Pts
1. Optimize Energy Performance In California	1.1	Performance of ENERGY STAR for Homes		Prereq	Y			
	1.2	Exceptional Energy Performance		19	0	0		0
7. Water Heating	7	Efficient Hot Water Distribution		2	0	0		0
8. Lighting	8.1	Title-24 Lighting		Prereq	Y			
	8.2	Improved Lighting	EA 8.3	1	0	0		0
	8.3	Advanced Lighting		3	3	0		0
9. Appliances	9.1	High-Efficiency Appliances		2	1	0		0
	9.2	Water-Efficient Clothes Washer		1	0	0		0
10. Renewable Energy In CA	10	Renewable Energy System		10	0	0		0
11. Residential Refrigerant Management	11.1	Refrigerant Charge Test		Prereq	Y			
	11.2	Appropriate HVAC Refrigerants		1	1	0		0
			Sub-Total for EA Category:	**38**	5	0		0
Materials and Resources (MR)		(Minimum of 2 MR Points Required)	OR	Max	Y/Pts	Maybe	No	Y/Pts
1. Material-Efficient Framing	1.1	Framing Order Waste Factor Limit		Prereq	Y			
	1.2	Detailed Framing Documents	MR 1.5	1	1	0		0
	1.3	Detailed Cut List and Lumber Order	MR 1.5	1	1	0		0
	1.4	Framing Efficiencies	MR 1.5	3	0	0		0
	1.5	Off-site Fabrication		4	0	0		0
2. Environmentally Preferable Products	2.1	FSC Certified Tropical Wood		Prereq	Y			
	2.2	Environmentally Preferable Products		8	3	0		0
3. Waste Management	3.1	Construction Waste Management Planning		Prereq	Y			
	3.2	Construction Waste Reduction		3	2.5	0		2.5
			Sub-Total for MR Category:	**16**	7.5	0		2.5

LEED for Homes Simplified Project Checklist for California (continued)

				Max Points	Project Points Preliminary			Final
Indoor Environmental Quality (EQ)		(Minimum of 6 EQ Points Required)	OR	Max	Y/Pts	Maybe	No	Y/Pts
1. ENERGY STAR with IAP	1	ENERGY STAR with Indoor Air Package		13	0	0		0
2. Combustion Venting	2.1	Basic Combustion Venting Measures	EQ 1	Prereq	Y			
	2.2	Enhanced Combustion Venting Measures	EQ 1	2	2	0		0
3. Moisture Control	3	Moisture Load Control	EQ 1	1	0	0		0
4. Outdoor Air Ventilation	4.1	Basic Outdoor Air Ventilation	EQ 1	Prereq	Y			
	4.2	Enhanced Outdoor Air Ventilation		2	0	0		0
	4.3	Third-Party Performance Testing	EQ 1	1	0	0		0
5. Local Exhaust	5.1	Basic Local Exhaust	EQ 1	Prereq	Y			
	5.2	Enhanced Local Exhaust		1	1	0		0
	5.3	Third-Party Performance Testing		1	0	0		0
6. Distribution of Space Heating and Cooling	6.1	Room-by-Room Load Calculations	EQ 1	Prereq	Y			
	6.2	Return Air Flow / Room by Room Controls	EQ 1	1	0	0		0
	6.3	Third-Party Performance Test / Multiple Zones	EQ 1	2	0	0		0
7. Air Filtering	7.1	Good Filters	EQ 1	Prereq	Y			
	7.2	Better Filters	EQ 7.3	1	0	0		0
	7.3	Best Filters		2	0	0		0
8. Contaminant Control	8.1	Indoor Contaminant Control during Construction	EQ 1	1	1	0		0
	8.2	Indoor Contaminant Control		2	0	0		0
	8.3	Preoccupancy Flush	EQ 1	1	1	0		0
9. Radon Protection	9.1	Radon-Resistant Construction in High-Risk Areas	EQ 1	Prereq	N/A			
	9.2	Radon-Resistant Construction in Moderate-Risk Areas	EQ 1	1	0	0		0
10. Garage Pollutant Protection	10.1	No HVAC in Garage	EQ 1	Prereq	Y			
	10.2	Minimize Pollutants from Garage	EQ 1, 10.4	2	2	0		0
	10.3	Exhaust Fan in Garage	EQ 1, 10.4	1	0	0		0
	10.4	Detached Garage or No Garage	EQ 1	3	0	0		0
			Sub-Total for EQ Category:	**21**	7	0		0
Awareness and Education (AE)		(Minimum of 0 AE Points Required)		Max	Y/Pts	Maybe	No	Y/Pts
1. Education of the Homeowner or Tenant	1.1	Basic Operations Training		Prereq	Y			
	1.2	Enhanced Training		1	0	0		0
	1.3	Public Awareness		1	0	0		0
2. Education of Building Manager	2	Education of Building Manager		1	0	0		0
			Sub-Total for AE Category:	**3**	0	0		0